

THE BIOLOGIST



Vol. XIX, No. 1

October, 1937

PHI SIGMA

BIOLOGICAL HONOR SOCIETY

"The object of Phi Sigma is to promote interest in biological research. Although originally designated as an honorary biological research society, it should now be considered as a working guild of biologists interested in research. In effect, election to Phi Sigma should be an opportunity for better work, rather than merely election to an honorary society."

Mile Posts:

- 1915 March 17, Alpha Chapter organized, Ohio State University.
- 1916 May, Central Governing Body organized, BIOLOGIST first issued.
- 1917 June, last War-time BIOLOGIST issued.
- 1921 February, BIOLOGIST revived.
- 1924 December, First National Convention, Constitution revised, Washington, D. C.
- 1925 December, Second National Convention, First Scientific Program, Kansas City.
- 1926 December, Third National Convention, Second Science Program, Philadelphia.
- 1927 December, Third Science Program, Nashville.
- 1928 December, Fourth National Convention, Coat-of-Arms adopted, Fourth Science Program, New York.
- 1930 January, Council Meeting, Ritual Revised, Norman, Okla.
December, Fifth National Convention, Fifth Science Program, Cleveland.
- 1931 Phi Sigma Letters Registered, U. S. Patent Office.
- 1932 December, Sixth Science Program, Atlantic City.
- 1933 June, Sixth National Convention, Seventh Science Program, Chicago.
- 1935 December, Seventh National Convention, Eighth Science Program, St. Louis.

Expansion:

The Constitution provides that: "An active chapter may be established in any institution of learning which requires for graduation the equivalent of four years of collegiate work, and which is equipped with facilities for research work. - - - Any petitioning group must be active for at least one year before it may be granted a charter."

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Copyright 1937 by the Phi Sigma Society, an organization devoted to the promotion of interest in biological research, founded at Ohio State University, March 17, 1915. The Biologist is the official quarterly publication of the society, issued ordinarily in October, December, February and April, as a medium of exchange between chapters, as an interpreter of Council policies, and as a stimulus to the fellowship in science for which Phi Sigma stands.

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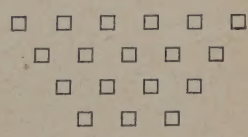
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DIRECTORY

OF ALL ACTIVE AND INACTIVE CHAPTERS

The list of chapter officers will be found in the CHAPTER NEWS section next issue.

ALPHA

Ohio State University, Columbus, Ohio, founded March 17, 1915, (Inactive).

BETA

University of Michigan, Ann Arbor, Michigan, founded June 3, 1916.

DELTA

University of Maine, Orono, Maine, founded January 27, 1917.

EPSILON

University of Denver, Denver, Colorado, founded March 5, 1917.

ZETA

University of Wisconsin, Madison, Wisconsin, founded May 30, 1917.

ETA

University of Akron, Akron, Ohio, founded April 20, 1921.

THETA

Michigan State College, East Lansing, Michigan, founded April 9, 1921.

IOTA

Washington University, St. Louis, Missouri, founded May 28, 1921.

KAPPA

University of Kansas, Lawrence, Kansas, founded May 31, 1921.

LAMBDA

University of Montana, Missoula, Montana, founded May 4, 1921.

MU

University of California, Berkeley, California, founded April 27, 1922.

NU

Washington and Jefferson College, Washington, Pennsylvania, founded May 11, 1922.

XI

University of Nebraska, Lincoln, Nebraska, founded May 3, 1934.

OMICRON

University of North Dakota, Grand Forks, North Dakota,
founded May 26, 1924, (Inactive).

PI

Emory University, Georgia, founded January 3, 1925.

RHO

University of Illinois, Urbana, Illinois, founded March 28, 1925.

SIGMA

University of Florida, Gainesville, Florida, founded December 4, 1925.

TAU

Duke University, Durham, North Carolina, founded March 4, 1926.

UPSILON

Miami University, Oxford, Ohio, founded May 7, 1926.

PHI

University of New Hampshire, Durham, New Hampshire, founded May 21, 1926.

CHI

Montana State College, Bozeman, Montana, founded February 11, 1927.

PSI

University of Washington, Seattle, Washington, founded April 7, 1928.

OMEGA

University of Oklahoma, Norman, Oklahoma, founded March 24, 1928.

ALPHA ALPHA

University of Southern California, Los Angeles, California, founded May 17, 1930.

ALPHA BETA

Mount Union College, Alliance, Ohio, founded May 17, 1928.

ALPHA GAMMA

University of South Dakota, Vermillion, South Dakota, founded May 15, 1928, (Inactive).

ALPHA DELTA

Lawrence College, Appleton, Wisconsin, founded March 7, 1929.

ALPHA EPSILON

University of Pittsburgh, Pittsburgh, Pennsylvania, founded March 23, 1929.

ALPHA ZETA

College of William and Mary, Williamsburg, Virginia, founded April 19, 1930.

ALPHA ETA

Oklahoma Agricultural and Mechanical College, Stillwater, Oklahoma, founded March 13, 1930.

ALPHA THETA

State College of Washington, Pullman, Washington, founded May, 1930.

ALPHA IOTA

Bucknell University, Lewisburg, Pennsylvania, founded January 9, 1932.

ALPHA KAPPA

Hunter College, New York City, founded January 8, 1932.

ALPHA LAMBDA

University of Utah, Salt Lake City, Utah, founded February 13, 1932.

ALPHA MU

University and State Agricultural College of Oregon, Eugene-Corvallis, Oregon, founded November 18, 1933.

ALPHA NU

University of New Mexico, Albuquerque, New Mexico, founded April 21, 1935.

ALPHA XI

Rhode Island State College, Kingston, Rhode Island, founded May 17, 1935.

The National Convention

Official Announcement

The eighth National Convention of Phi Sigma will be held this year during the Christmas holidays, December 28 and 29, 1937, at Indianapolis, Indiana.

The Warren Hotel has been assigned as our headquarters by the American Association for the Advancement of Science.

While all details of our meetings are not yet available we are planning business meetings for the morning of Tuesday, December 28, and the morning of Wednesday, December 29. Our scientific session for the reading of papers by delegates will be held on the afternoon of Tuesday, December 28. If additional time is required for either business or the scientific meetings Thursday will be available.

The banquet which is given for all delegates and for any other Phi Sigma members present will be held the evening of December 29. A speaker of national prominence will speak.

Delegates

Each chapter in good financial standing is entitled to one delegate. Your chapter should elect this delegate and an alternate *at once*. Official blanks on which to record your election will be sent to your chapter soon. Railroad fare (*only*) of the delegate will be paid in advance by the National Treasurer. The delegate or his chapter must be prepared to pay other expenses, such as the hotel bill and meals. It is of course understood that all national financial obligations of your chapter must be met *well in advance* of the convention date; if this is not done representation will be denied. The delegate you choose should make reservations *at once* at the Warren Hotel, in order that a room may be obtained before all of the less expensive ones have been taken. Your delegate is of course, free to choose any hotel he wishes. The rates quoted for the Warren Hotel are—single, \$2.25-\$3.50, double \$3.50-\$5.00. The location of the hotel is on Illinois St. near Maryland St. just about one block from general headquarters of the A.A.A.S.

Chapter Reports

Chapter reports must be brought to the first business meeting and turned over to the National Secretary by the delegate. It is expected that all of the chapter officers will co-operate in writing this report.

The chapter report is to include all of the more important events of the chapter for the time since the last convention (St. Louis, 1935). As a part of this report a brief financial statement should be included.

Railroad Rates

The arrangements for reduced railway rates (by the receipt-certificate plan) of a fare and a third for the round trip have been made in the name of the American Association for the Advancement of Science and Associated Societies and are available to members of any society meeting with the Association at the time. Members of Phi Sigma *must* secure railway certificates *when purchasing tickets* to Indianapolis, stating that they are to attend the meeting of the American Association for the Advancement of Science. The rates are available from practically all over the United States and Canada. Certificates should be left at the A. A. A. S. registration room in Indianapolis at the time of registration, in order that they may be endorsed by the A. A. A. S., and validated by the railway agent. They will later be returned to their owners and will then entitle the holder to purchase a return ticket at one-third of the regular one-way fare. There is a registration fee of \$1.00.

Convention Business

Each chapter is expected to send in to this office at the *earliest possible date* a list of all matters which it wishes discussed at the business meeting of the convention. It is obvious that this is the only way that your National Officers have of knowing your wishes, and it is hoped that if your chapter has any opinions to express, any criticisms to offer, or any desires which may affect the national organization, you will indicate them in a letter to the National Secretary at the earliest possible moment. If the chapters co-operate in this way, it will be possible to summarize such letters and lists, and prepare a letter which will be sent to each chapter for consideration *before* the convention. Each delegate may come to the convention instructed by his chapter on these questions, but he should in any case be left **FREE** to vote *as he thinks best after he hears the discussion at the convention*.

Please send a copy of this letter of suggestions for convention business to Dr. A. M. Keefe, Editor of the *Biologist*, West De Pere, Wis. It is planned to issue the second number of the *BIOLOGIST* early in December and to print in this number at least a summary, possibly a complete list of all matters suggested by the several chapters to be

brought up for discussion at the business sessions. In this way each chapter may have the opportunity to consider each item *before* the convention. All such matters must be in the hands of the Editor by November 7 so that it will be possible to go to press in time to get the BIOLOGIST to you by December 1. In this connection please send in also any chapter news or other material which you wish printed in this December issue. This year the BIOLOGIST will be issued as a quarterly.

The Scientific Session

Some changes will be made this year for what the Council feels are good reasons. At the last few conventions a rather large number of papers have been presented by members. Of course many of these papers were written by members not attending as delegates. This has been criticized by other members and it has been decided to try a new scheme this year. Briefly, to hold just one half day for the reading of papers, these to be at least largely by the members actually present. In this way much more time will be allowed delegates to attend other society meetings such as Section F (Zoological Sciences) and Section G (Botanical Sciences) of the A.A.A.S. We feel that in this way members or delegates will spend their time much more profitably and get a more nearly properly balanced idea of national scientific meetings in their field.

Titles of papers to be presented by delegates should reach this office *not later* than November 20. Abstracts should be here as soon after this date as possible. These abstracts should be limited to 200 words. Such abstracts will be published in the Biologist.

Summary

1. Convention to be held at Indianapolis, Indiana, Tuesday and Wednesday, December 28-29. Meeting room to be announced later.

2. Delegates

One from each chapter if all national financial obligations have been met.

Railroad fare *only* will be paid and in advance of trip.

Banquet for delegates gratis.

Reservations for hotel rooms should be made immediately.

Delegates must be present at all meetings.

3. Chapter Reports.

To be sent with delegate and to cover last time since the St. Louis meeting, December, 1935.

4. Railroad Rates.

Arrangements have been made for fare and a third rate.

Certificates must be obtained *at the time of payment* of one-way fare to Indianapolis.

5. Convention Business.

Send in list of business your chapter wishes discussed at convention *at once*, both to this office and to Dr. Keefe.

6. Scientific Session.

Titles of papers to be in this office by November 20.

Abstracts (limited to 200 words) as soon as possible after this—but not later than December 1.

It is the sincere hope of your national officers, who are giving their time to the good cause for which Phi Sigma stands—the encouragement of the spirit of research among young biologists—that each chapter will do its best and co-operate to the fullest in making this convention the best Phi Sigma has ever held.

A. I. ORTENBURGER, *National Secretary.*

THE MEANING OF "AMERICA"

Who knows the origin of the word "America"? Very few Americans do. When most of us are challenged to answer that question, we reply, "America, of course, as every school child knows, was named after the great Italian cartographer, Amerigo Vespucci." That's so, but where did Vespucci get his christen name? What was the origin of his name Amerigo?

The name has been traced back and gives a real inspiration to our American life because the word Amerigo was originally, in Gothic, "Amalric." As the Gothic invasion went over the Alps and into Italy, the harshness of the Gothic language was softened by the patois of the vowel-loving Italian and "Amalric" became "Amerigo," and then became America.

Now what does "Amalric" mean? Amalric was composed of two words "Amal" plus "ric." "Amal" meant work and "ric" meant to conquer: All conquering work! That is what America means, and can you imagine a more inspiring name for any country than that, "The work that conquers: All conquering work"?

There is nothing that America needs more today than that her people get back to work.

THE FRESHMAN AND SCHOLARSHIP*

DAVID CAUSEY

Professor of Zoology, University of Arkansas

To pause amidst the bustle and confusion of starting your university work to consider scholarship and the relationship of freshmen to it may strike you as ill-timed. There is a time and place for everything and perhaps this might better be considered at our leisure under other circumstances. As I look into your faces there comes the question which always arises in a teacher's mind as he faces a new group of students—just why are they present? Why are you here this afternoon? As the years slip by in a teacher's life he comes to certain generalizations as to why students come. Some of you are here today because of ambition, because of a desire to achieve fame and fortune to which an education may be a stepping stone. There is little question that the university can help you in that direction, especially in preparing for the various learned professions. Some of you have come fired with a bright desire to prepare to be of service to your fellowmen, possibly with the intention of going back home to share your gain in knowledge with your community. I hope that there are many such among you. Some of you, unfortunately, have responded to the lure of a university's social activities, and have come to dance about the fitful fires of good times. No doubt, like other butterflies, such of you will have but a brief university day. And some of you just came and your teachers, as long as they remember you, will never cease wondering just why you did it.

Scholarship is an intangible state—one that is difficult to define in any way approaching completeness. We can, however, discuss some of its attributes and perhaps in this way approach an understanding of what we mean. Obviously scholarship includes knowledge. Much of that knowledge, the siftings of the treasures of the centuries, lies about us between the covers of books. Within the textbooks you will buy and the thousands of books in the University Library which are at your disposal for the asking are the wisest thoughts, the mature conclusions, the brilliant ideals and the brightest hopes of the great minds who have gone before us. This knowledge is offered to you so cheaply that no doubt many of you, who think that price determines value, will reject it as worthless.

*Address to Freshman Class, University of Arkansas, Sept. 15, 1936.

A warning about books may not be out of place. Most knowledge is to be found in books, but all books do not contain it. All books are not worth study, many are not even worth reading. Only much experience in using books will serve to guide you, and in gaining this experience you must be prepared to make mistakes. No book speaks alike to any two people. How a book speaks to you will depend upon what you have brought with you and the effort which you make while here at the university. There will be classical allusions as meaningless to some of you as so many words written in Japanese. There are reference works which will open such doors, and still better, courses in the classics which mankind has found good for more than two thousands of years. There will be philosophical thoughts and scientific truths that will require effort to understand. The effort is worth while, and every one who has passed through this institution has had to acquire such understanding if he wished to listen to what books have to say. In other words, what you may have failed to bring with you must be added here.

In your contact with books please bear in mind that knowledge is older than books and that much knowledge is gained elsewhere. Books provide an easy way to get knowledge, as safe and painless a method as has been devised. Don't let the subtle magic of the printed page mislead you; a thing is not necessarily so because it is set in print. Test it as the opportunity arises, believe your own eyes, and use the common sense you have in weighing your information until you have a basis for making up your own mind.

As an aid to the acquiring of knowledge the University of Arkansas has a faculty of teachers presumably trained in their various specialties. As you get acquainted with the faculty you will come to see that we have several types of teachers on this faculty—it is too large to avoid such a condition even were it desirable. Some, probably the majority of us on this faculty, you will find to be average craftsmen doing ordinary jobs of teaching and, unfortunately, devoid of the brilliance and divine fire which lifts you into view of new horizons. We have our place, a prosaic and useful one, passing on to you the intellectual staff of life out of which you can build your own foundations for scholarship. A few of this faculty are, I hope, true scholars, men who will light up new worlds for you, give you visions which will go with you through all the years to come and, when your life's work is done and that far off evening has come, will still dwell in your memory as men whom it has been a privilege and inspiration to know. From all these types

of teachers you can gain knowledge, and there is no easier way of acquiring knowledge than in the class room where it comes predigested for your easy absorption.

Knowledge alone does not bring scholarship. All of us have known educated fools staggering under the weight of academic degrees—disorganized mental heaps of knowledge out of which flutter at unexpected intervals weird scraps of fact and fancy that none can use. They are moths which flutter here and there in the soft light of knowledge, sipping at first one flavor of thought and then another, but never with the wisdom of the bee which concentrates upon a particular kind of blossom at a time. Scholarship requires organization, knowledge must be fitted together just as truly as are the stones of an archway. Your facts and principles must serve as the stones and mortar with which you build your scholarship, and if faithfully done, will rival the archway in its endurance. Part of this organization may be acquired quite easily, most books have some sort of framework upon which the author hangs his details, and though you may sometimes have difficulty in discovering it, most teachers follow some sort of a plan in conducting their courses.

There is, however, a broader organization, a coordinating of facts and of generalizations, which is essential to scholarship, and this you must do for yourself if scholarship is your aim. You will sit in classes taught by specialists, men and women who have devoted their years of thought to some specialized branches of knowledge. Day after day they will lay before you details and ideas which, since they are specialists, they will solemnly assure you are of such supreme importance that you must never forget them. A verb form from a language teacher, a formula from a chemist, an equation from a mathematician, a way of poaching an egg from a home economics teacher—all these may be laid before you as the very sinews of scholarship and intellectual attainments. If you seek for scholarship you must attempt, on your very own and in your none too frequent leisure moments, to correlate these items, these ingredients of the mental hash we thrust upon you, and out of them build something of greater scope. Scholarship means knowledge put into order, correlated and integrated.

There is more to scholarship than knowledge and organization. You may have acquired an immense knowledge and have it stored away in mental pigeon holes and filing cabinets with an index past reproach and still not have achieved scholarship. Knowledge to be worth while must be applied and made useful. In saying this I am

not referring to what scientists call pure research—the scholastic search for knowledge for its own sake with no thought of its value. Such statements are mere tricks of speech. Years of rich returns from that type of scholastic activity have taught us that such knowledge is invested knowledge which pays a high rate of interest and which is only awaiting the proper moment to declare a dividend past present belief. There is no such thing as useless knowledge. Instead I refer to the application of the present day knowledge of known utility. Centuries rich in human experience, of successes and of failures, lie behind us. Their contribution of knowledge, which we must individually acquire and organize, also carries with it an account of almost endless experiments in the application and use of that knowledge. Scholarship includes a knowledge of such results and the proper estimation of the values to be expected by the use or application of that knowledge. It means that we need not go on repeating the mistakes of the past, it means that with a firm grasp of knowledge and how to use it we can do things now and in the future both better and more wisely.

Scholarship contains vision. It includes the backward glances over the past of the whole world, geological vision of the vast epochs of the past and of what happened to the world in those ancient days; historical vision over the recorded ages of man and of what he both did and tried to do; philosophical vision of what meanings he has read into life and its purposes at various times in the past and present; religious vision of what man has believed and still believes; while permeating all these is an economic vision of the material factors of needs and desires, of conquests and of lost hopes, factors upon which mankind has played as upon the keys of a piano.

Scholarship includes a forward vision looking into the future, of what man is heading toward; of evaluating the currents of human development and of choosing from them the ones which promise to give mankind a safe voyage through the shoals and rocks of disaster. We have nothing but the past by which to gauge the future, and in a time of experimentation such as you are now facing, with almost every conceivable form of social organization either in existence or being proposed, it is well to attempt to achieve the vision of scholarship and endeavor to plot your future course instead of drifting helplessly. It is well to remember that in all probability we shall not be the last generation of mankind, that within thirty or forty years from now most of you will have had your little day in the affairs of this world and will have been replaced by a new set of people. Before you leave

the University of Arkansas I hope that you will have considered this fact most carefully and have reached a decision as to what you are going to leave those future children of yours. Will it be a state of eroded farmlands and treeless wastes and no natural resources left for them to try their skills upon? Or will it be a state which you have helped care for and possibly improved a bit? It isn't yours nor mine to waste and exploit—it is merely loaned to us for our lifetimes. In all fairness to those who will follow us we should respect our trust and pass it on in good condition.

Scholarship means putting the proper value upon things. It means much more than the mere price of things at the moment—it means a study and understanding of the value of the things themselves both now and tomorrow. A momentary impulse may be gratified today very cheaply and yet require costly payment the rest of one's life. A nation may achieve a cheap success today and go bankrupt tomorrow. One of the strange passages in the Bible says:

“While we look not at the things which are seen, but at the things which are not seen: for the things which are seen are temporal; but the things which are not seen are eternal.” (II. Corin. 4:18).

Perhaps it refers to scholarship of a high order, which sets aside the obvious and apparent and looking deeply into the meaning of things, sees the lasting values which lie beneath the surface.

You are investing the most valuable thing you possess in attending the University of Arkansas—your time. Just now, with life's enthusiasm and zest running high in your young bodies, it seems so endless as to be practically worthless. You will cheerfully squander it in a dozen different ways and perhaps invent new ways of throwing it away. Yet most of you who sit before me have lived a third of your respective lives, and in another score of years will be middle-aged. Forty years from now we couldn't gather enough of you who sit here today to form a corporal's guard. I wonder if it wouldn't be worth while to pause occasionally and take stock as to what you are getting out of this investment you are making. Possibly a bit of the sense of values which is a part of scholarship would guard you from losing too much of that fleeting treasure—your time.

To me scholarship means all of these things: knowledge, organization and coordination, application, vision, and a sense of values. The question may be in your minds—“what of it, what shall we do about it?” I can but answer that the door to scholarship is open and many here at the University of Arkansas stand beside it to welcome you.

Only you can decide whether or not to enter. Of those who enter only a few will stay—many are called but few are chosen. Most of you will not go in for scholarship, especially that part of it which requires the search for knowledge and its understanding. You are too concerned with the workaday world and its problems of today—the economic stresses and urges of the moment, the ephemeral political and social strivings. You will say that you are too practical, that you must be doing and not dreaming, achieving and not merely speculating. Well and good, we have no quarrel with you, it is only your support and aid which makes scholarship possible. We hope that you will, during your stay with us, not only gain the professional tools which will help you in that outside and busy world, but also come to have an understanding of and sympathy for scholarship of that type.

To those of you, however, who are tempted to step within and, after proper testing are found worthy and well qualified for the highest type of scholarship, I say “beware!” Be sure that you are aware of the task ahead of you and of its possible rewards. Scholarship is a life-work, not a passing fancy, and usually as the world values things, pays poorly. Most scholars are poor men so far as money goes. They may miss both the night clubs and the operas, may be even unaware of such losses. They tend to live in cottages and bungalows instead of country estates and city palaces, to drive cheaper cars or walk. They do, however, have a rich reward, for scholarship brings its own reward. As the years go by you will come to realize that each of you lives not one life but three. One is your worldly life, the life in which you make a living, meet your professional associates and score your successes or fall under your failures. A second, I hope, will be the family life in which your wife and children and your few intimate friends have a part. Much of the joys and meaning of life will center about this second phase of your lives. Only when it has come to you will you fully understand the motives of those parents of yours who, with sacrifice and great hopes, made it possible for you to be here. The third life is a private or secret life which you will lead when alone with your thoughts. It is the only one of the three lives you live in which you are truly yourself and live according to your ideals, a life in which the might-have-beens are realities. It is a curious life in which there seem to be only two states, the future when you are young and the past when you are old, but never a present. This personal life is the life the scholar leads so fully, a lonesome life into which only occasionally does he permit a guest. That guest will be another scholar like himself, with understanding, and for a brief

interval they will exchange thoughts and struggle with the meanings of things, and try, each in his little sphere of activity, to help the other onward a little way.

We live in a state which is none too prosperous. In spite of enthusiastic boosters I am delighted to say that thousands of acres seem utterly worthless for the making of money and will probably retain their beauty for the generations of the future. As I see it today the State of Arkansas will probably never take a place among the great in industrial activities nor be among the first half dozen states in agricultural productivity. A moderate future seems to be the prospect and not a spectacular one. But you who are gathered here today can, if some few of you resolve to achieve true scholarship, make Arkansas great in a way which will cause the nation and the world to marvel and to pay homage. Scholarship is not geographical. The desire for scholarship, for service to one's fellow beings, is as the yeast in bread, multiplying a thousand fold and leavening great masses. Just a few of you going, in the course of time, into the professions—law, medicine, politics, teaching, the ministry—with the spirit of scholarship in your souls can be centers from which more and more scholars arise.

I suspect that many of you as you have listened to me have been wondering about grades. As I understand the matter grades have nothing to do with scholarship. Due to the solemn wisdom of your elders and the traditions they conform to, you will take many courses. You must accumulate so many hours of credit and these credits must be divided among certain subjects. Some of these courses you may dislike, others merely tolerate with mild interest, and a few, I hope, will enthrall you heart and soul. Some students make good grades in all courses, most students do well in some and are mediocre in the rest, while some prove to be equally hopeless in all they take. Grades are a necessary evil and we regret having to establish them as much as you do. For purely administrative purposes such as election to honor societies, for sending you home as intellectually hopeless, or for bestowing upon you some particular degree some four years from now we are forced periodically to make guesses about you which we call grades. We have no measure for scholarship as I have discussed it except that of the results as determined by the passage of time. Grades you can obtain at the end of each semester; scholarship, if attained at all, will become apparent fifteen to twenty or more years from now, and only then can your success as students and our success as teachers be determined.

P.C.B.—THE KEY TO BIOLOGICAL PROGRESS*

LORIN J. MULLINS (Mu '36)

University of California

PCB or physico-chemical biology is not a new science by any means. Biologists for years have known it under many names—General physiology, Biophysics, and Quantitative Biology, to mention a few. Nevertheless in the past few years PCB has been coming into its own right as a separate science; the only obstacle to the more rapid approach of biology to the realm of an exact science is the biologists themselves.

“The time has come the walrus said to talk of many things. . . .” among these is the place of quantitative biology in biology. Any biologist must realize that PCB, if it is not his special field of endeavor, is a tool. Just as physics and chemistry have proved valuable tools to the student of PCB, so PCB should prove a valuable tool to the general biologist. Perhaps the morphologists will hold up their hands in protest—quantitative methods! I am a biologist, not a chemist! Yet Blinks (Bull. Torrey Bot. Club 57:389-95 (1930)) has used the quantitative chemical analysis of the salt content of the sap of the marine alga *Halicystis* to determine the existence of a new species. The ease of identification is extraordinary as compared with disputable morphological methods.

Some will argue that individual variation in biological material precludes the use of quantitative methods, yet from a logical point of view this cannot be true. One is just dealing with more variables than those usually employed in the physical sciences. Apparent individual variation is due to the fact that such things as age, time of year, past history, and mechanical treatment are not accounted for in the results as are pressure, temperature, and concentration. Some variables are yet unknown, but one must realize that only by the persistent application of rigorously quantitative methods will these variables be disclosed.

PCB as a science in its own right, deserves all the support in research, both financial and academic, that biologists can give, for it is the science upon which depends the future of biology and medicine. When physical chemistry began to develop at the close of the last century, there were those who saw in it the key to the future of chemistry

both theoretical and industrial, and they supported this new science, so too let there be those who will forsee the future of biology under PCB, and support this science.

I would like very much to write a book on PCB; not a textbook for we have several excellent texts (Seifriz-Protoplasm, Heilbrunn-Gen'l. Physiology, and Barnes Gen'l. Physiology) but a book which would guide the student thru the theory of PCB, assist the research student and the faculty investigator in their problems by showing the types of problems which may be solved with the aid of this science, and even aid the physician in the treatment of patients through the application of physico-chemical principles.

The South Australians think "the constellations are groups of children". "Three stars in one of the constellations are said to have been formerly on the earth: one is the man, another his wife and the smaller one their dog; and their employment is that of hunting opossums through the sky."

The implication that human beings get into the heavens recurs in the Tasmanian tradition that fire was brought by two black fellows, who threw fire among the Tasmanians and after staying awhile in the land, became the two stars, Castor and Pollux. Possibly the genesis of this story was that the coupled lights of these stars were fancied to be the distant fires lighted by these men after they went away.

Such a conception occurs among the North American Indians who say that the Milky Way is "the path of Spirits", "the Road of Souls," where they travel to the land beyond the grave and where their camp-fires may be seen blazing as brighter stars. It harmonizes too with the belief of some North Americans that their medicine men have gone up through holes in the sky and have found the sun and moon walking about there like human beings and looked down through their peepholes upon the earth below.

—*Spencer's Synthetic Philosophy.*

EDITORIALS

A Quarterly Biologist

As the result of what your Editor chooses to regard a constructive criticism of the BIOLOGIST in the Chapter Letters of last Spring's issue, we have begun an experiment in this the first of the *four* BIOLOGISTS to be issued this year. You will notice that in general the format has not changed. We have dropped the extra colors on our cover. We have changed the paper stock. We have cut down the number of pages. Whether this type of magazine will materially reduce the cost of publication remains to be seen. Whether it will appeal to the membership also remains to be seen.

Your Editor invites each member, each Chapter Officer, to be kind enough to write a personal letter and let him know just what you think of the change. If you do not care to do this, at least be kind enough to discuss the matter in your next Chapter Meeting, and instruct your Editor or Secretary to include your corporate opinion in the Chapter News Letter for the December issue. This should be in my hands not later than Sunday, November 7th.

I hope you realize by now that your Editor tries to be the "servant of the servants" of Science. As such your Editor is trying to put out the kind of BIOLOGIST you want.

Now, what *do* you want?

On to Indianapolis!

1937 is national convention year. The American Association for the Advancement of Science is bringing its annual session to a city that is both centrally located, and somewhat of a railroad center, Indianapolis, Indiana. Thus we are afforded a splendid opportunity to get together again, to discuss the problems of Phi Sigma, exchange chapter ideas, have our own scientific session, and attend those of the great national scientific societies.

To represent a chapter of Phi Sigma at the Indianapolis meetings will be one of the greatest privileges within the province of a chapter to bestow. As such, each chapter will want to study its choice of a delegate with due consideration and reflection. Each chapter will want

to send a student-member who will not only be an able representative in our deliberations, but will present his own research paper, and who will want to attend the sessions of some other scientific organization. Thus will Phi Sigma, your chapter and Science best be served.

Again

As the student year takes up its course and schedules are adjusted to the satisfaction of deans and professors, it is well for us to do a little personal stock-taking. We have all gone a little way in the accumulation of hours, credits, information and research experience prescribed as essential for the degree we seek. Aside from the grim necessities of meeting the requirements in our course-work, and over and beyond the necessary hours of sleep and feeding, there still remain those privileged moments when, on an unofficial status, we can associate with one or more of our fellow human beings.

In the classroom, the library and the laboratory, we are brains personified. At the table and abed we counterfeit the animals. It is only in our social moments that we are intensely and most typically human. No matter, then, what our position in the educational scheme of things, and no matter how we may object to the use of a political term, we should definitely plan the economy of our social life. Administrations and faculties will plan our class, laboratory and library hours. The exigencies of our nature take their toll of sleeping and eating hours. For us is left only the determination of our leisure time. Such a planned economy is for each of us a criterion of our ambitions and our ideals.

Vorvaerts!

Increasing enrollments in almost every educational center, former students returning to complete courses abandoned during the depression era, a general feeling that somehow or other, things are "going to pick up", makes education in the year of 1937 more of an adventure than ever. Last year's increase in the membership of Phi Sigma bodes well for this Fall. If the increase is here to be gathered, let us not falter in doing so, winnowing out the mere "joiner" chaff, and concentrating on those whose personality and mentality warrant the hope that they will bring something to the Society in return for what it has to offer them.

By reason of a weak, half-hearted, unoriginal, or disinterested membership more than one chapter has fallen in the past. So also

will others fall in the future. Such is the inevitable way of all living things.

Chapter News Letters

Are due November 7th, *at the latest*, for the November issue which should be in the hands of all the membership by early December. In addition to the chapter news letter,—which by the way should follow the accepted form, starting off with the list of chapter officers,—we shall expect a statement of such propositions as each chapter will present for the consideration of the deliberative sessions of the Eighth National Convention in Indianapolis during the last days of December. We shall further expect each chapter to submit, if they can or care to, their nominees for the offices of National Chancellor, and National Treasurer,—the terms of Dr. Paul A. Warren, (Beta '30) and Mr. Erwine Hall Stewart, (Epsilon '17), expiring with the closing of this Convention.

This means that the December issue of the BIOLOGIST will be chock full of interesting material. If every chapter editor or secretary will take this editorial seriously, your next BIOLOGIST will carry to you new ideas: some agreeable, some repugnant; some proposals that are as stale as Pharaoh's funeral bread, and some that are so new, and wild, that they will be verbal dynamite. After all, isn't this what the BIOLOGIST is for? To let every member back home in his own school know exactly what this coming convention of Phi Sigma is going to face, will be the purpose of the next BIOLOGIST.

To sum up: By Nov. 7th *at the latest* each Chapter Secretary or Editor should have in the BIOLOGIST Editor's hands: 1/ the officers of the chapter, 2/ news of chapter plans, activities, accomplishments, membership research achievements, etc, 3/ chapter suggestions for the coming convention, 4/ chapter nominees for the national chancellorship and treasurership, 5/ chapter opinions on the new set-up of the BIOLOGIST.

Have you all got this straight? Get busy!

BOOK REVIEWS

Reviews printed here represent the candid opinions of various readers, not necessarily those of the members of the National Council, nor even those of the Editor

THE A. B. C. OF AGROBIOLOGY, O. W. WILCOX, W. W. Norton Co., New York, 1937. \$2.75.

This is a reference work which should be in every biological library, dealing as it does with the quantitative side of plant life and nutrition. While extremely technical at times, the author has managed to put enough life into his narrative to make it interesting not only to the professional biologist, but to the layman as well.

AIDS TO PHYSIOLOGY, HENRY DRYERRE, William Wood & Co., Baltimore, 1937. \$1.25.

This is one of those handy little compends which in a small compass manages to cover the really important points in human physiology. Although of vest-pocket size, it must not be confused with the all-too-common juvenile manuals of hygiene which parade around as physiologies. The author is professor of physiology in the royal college of veterinary science and an examiner in physiology for the royal college of surgeons,—which probably accounts for the publication of a second edition.

ALLERGY, ITS PRACTICAL APPLICATION, J. A. RUDOLPH, Dorrance & Company, Inc., Philadelphia, 1937. \$3.00.

This medical work is primarily interesting to physicians. However, the importance of allergic phenomena in our everyday lives make the possession of this work, or its availability on library shelves a real asset. If it did no more than kill a lot of silly health superstitions it would be doing enough.

ANIMAL BIOLOGY, MICHAEL F. GUYER, Harper & Brothers, New York, 1937. \$3.75.

Dr. Guyer's almost classical freshman text has been revised and appears in a

newer and much more attractive format. A reconsidered and largely rewritten edition, it should make new friends and keep all the old ones who have come to rely on it as a most effective pathway into biological studies.

ANIMAL COMMUNITIES IN TEMPERATE AMERICA, VICTOR E. SHELFORD, University of Chicago Press, Chicago, 1937. \$3.00.

This is a revised edition of a valuable study in animal ecology. While it has particular reference to the Chicago area, there is a wealth of information and illustrative material which makes it a valuable adjunct to any ecology course.

ANIMAL TREASURE, IVAN T. SANDERSON, Viking Press, New York, 1937. \$3.00.

Thrilling, hair-raising stories of the experiences of a Scotchman who went off on an African expedition to solve some of the "how's?" of animal ecology. You don't want to miss this one. It is not just another travel book.

THE AUTOBIOGRAPHY OF A SCIENTIST, ANONYMOUS, Scientific Publishing Co., Princeton, N. J., 1936. \$2.00.

These are the memoirs of Doctor Henry Manure, Professor of Archaeology, Palaeontology and Egyptology at Derbytown University, in which are embodied the contacts he made with the eminent members of the Derbytown faculty, such as Doctors Poopsick, Zitplaats van Bakhuizen, McFudd, Tripe, Liederkrantz, and Comrade Droolevitch. It also treats of the regrettable dispute between Doctors Tokus and Farthingale over the invention of the micro-piddleometer.

THE BIOCHEMISTRY OF CELLULOSE, THE POLYURONIDES, LIGNIN, ETC., A. G. NORMAN, *Oxford University Press, New York, 1937. \$5.00.*

This is a significant contribution to the general biochemical literature on cellulose and related cell-wall compounds, collating as it does the most important results that have been obtained in the research of the last few years. It should be in every botanical library.

BIOLOGICAL AND CLINICAL CHEMISTRY, MATTHEW STEEL, *Lea and Febiger, Philadelphia, 1937. \$8.00.*

Using the student himself as a clinical subject, performing on himself the tests he will later make on others is the refreshingly novel feature of this work. As long as American science can produce works like this there is hope for our medical advancement.

BIOLOGICAL TIME, P. LECOMPTE DU NOUY, *Macmillan Co., New York, 1937. \$2.00.*

Discovering in his medical work during the World War that tissue repair was five times slower in a person of sixty than in a child of ten, the author of this arresting work presents a new study of the phenomena of the aging process. The book has its profound implications not only for the theoretical scientist but also for the physician, the philosopher and the biologist in general.

BIOLOGY, THE STORY OF LIVING THINGS, G. W. HUNTER, H. E. WALTER and G. W. HUNTER III, *American Book Co., 1937.*

This is a college general biology written by a group of well known text-writers whose experience and classroom techniques give them and their joint production a unique position in their field.

THE BOOK OF BIRDS, GILBERT GROSVENOR EDITOR, *National Geographic Society, Washington, D. C., 1937. \$5.00 for the set.*

Here are two copiously illustrated volumes of reprints of previous articles on birds the world over which have

appeared in that paragon of magazines, The National Geographic. The popular appeal of such articles will make this an attractive addition to the grade and high-school library.

BRITISH GRASSES, S. F. ARMSTRONG, *Cambridge University Press, Macmillan Co., New York, 1937. \$5.25.*

This very compact volume presents two aspects of the grass problem. The first part of the book deals with the purely botanical phases of grasses and their classification. The second part is agricultural, or better, horticultural. That the book will help to give the United States some of the glorious green of the English countryside would be a consummation devoutly to be wished for.

BUGS, BIRDS AND BLIZZARDS IN THE YELLOWSTONE, HARLOW B. MILLS, *Collegiate Press, Ames, Iowa, 1937. 50 cents.*

Interesting stories of life as a park naturalist in the Yellowstone. Of special interest to young people who have leanings toward forestry or the national park services.

CHRONICA BOTANICA, FR. VERDOORN, *Chronica Botanica, P. O. Box 8, Leiden, Holland, 1937. 15.75 Holland Florins.*

The third volume of this new publication is worthy of its predecessors. The Chronica have come to be an indispensable adjunct for every botanical department or library, giving as each annual volume does, the list of every botanical society, institute or college department in the world, together with whatever new information may have developed about each.

CONCORD RIVER, WILLIAM BREWSTER, *Harvard University Press, Cambridge, 1937. \$3.50.*

Those who were favorably impressed by "October Farm," reviewed in the last issue of the BIOLOGIST, will have fresh cause for rejoicing in that another series of selections from the notes of William Brewster has been published. It is by way of becoming a literary classic, as well as a fascinating study of bird life.

CONTRIBUTIONS TO THE MICROSCOPIC ANATOMY OF THE PANCREAS, PAUL LANGERHANS, *Johns Hopkins Press, Baltimore, 1937. \$1.00.*

A well presented reprinting of the memorable treatise in the original German, with an English translation.

ECONOMIC BOTANY, ALBERT F. HILL, *McGraw-Hill Book Co., New York, 1937. \$4.00.*

A text-book of applied botany chock-full of useful information which should be practical not only for class work in this subject, but even more so in the library of the freshman botany lecturer who may wish to season his morphology and physiology with a little "practical" information.

ELEMENTARY PHOTOGRAPHY, NEBLETTE, BREHM & PRIEST, *Macmillan Co., New York, 1937. 72 cents.*

This is a simple manual which should delight those timid souls who are afraid to develop their own pictures, yet do not care to commit their negatives to the tender mercies of the commercial photographer.

ELEMENTS OF FORESTRY, F. MOON and N. C. BROWN, *John Wiley & Sons, New York, 1937. \$3.50.*

Bringing up to date the available information in a rapidly expanding practical science like forestry, this text supplants the previous editions by the same authors and the other works by Professor Moon. One misses the accent that should have been placed on forestry as a preventive of erosion and water loss. Dr. Sears' "Deserts on the March" is not referred to, either in the text or in the bibliographies.

THE ELEMENTS OF RESEARCH, F. L. WHITNEY, *Prentice-Hall, Inc., New York, 1937.*

A graduate dean performs a much needed service to American scholarship in this manual on research methods. While there is very little explicitly dealing with scientific research as such, the general thesis would be a help to the average graduate student in realizing the gravity of his attempt to produce original research. Perhaps nowhere else is the truth of the old dictum "fools rush in where angels

fear to tread" better illustrated than in the average university graduate school.

THE ETHNOLOGY OF THE TANAINA, CORNELIUS OSGOOD, *Yale University Press, New Haven, 1937. \$3.00.*

Number sixteen in the Yale University Publications in Anthropology, this 229 page, well illustrated volume brings with it the story of life and belief among the Tanaina, and Athapaskan Indian group inhabiting the south shores of the Alaskan mainland. Like all the Yale series it is a thorough piece of well-documented work.

FLORAL MORPHOLOGY, E. R. SAUNDERS, *W. Heffer & Sons, Ltd., Cambridge, England, 1937. 3s. 6d. net.*

Histological evidence for a reconsideration of some of the diagnostic characteristics relied on in plant classification, particularly as applied to the gynaeceum, constitutes the thesis of this book. Like most British works it is lacking in an index, and, strangely enough, in a bibliography. Perhaps these will be supplied in the forthcoming second volume.

FUR-BEARING MAMMALS OF CALIFORNIA, J. GRINNELL, J. S. DIXON and J. M. LINSDALE, *University of California Press, Berkeley, 1937. Two Volume Set \$15.00.*

Adequately illustrated by photographs of living animals both in color and black and white, this valuable set gives about all the information that might be desired about fur-bearers not only in California, but also wherever closely related species may be found. As such it will be indispensable for zoologists in general, and to hunters, trappers, or breeders likewise.

GENERAL AND ECONOMIC BOTANY, E. E. STANFORD, *D. Appleton-Century Co., New York, 1937. \$4.00.*

With the full significance of what is implied in the term "economic" in mind, the author of this general botany text has attempted, and successfully, to integrate his subject with the rest of the life-science field. The book is, therefore, strongly morphological. Pathological fungi receive more than the usual amount of attention for the same reason.

GENERAL BIOLOGY, L. A. KENOYER and H. N. GODDARD, *Harper and Brothers, New York, 1937. \$3.50.*

This is one of the finest, most level-headed and attractive of the new texts on general biology that have appeared this season. Those who teach biology as a unit course, not separating plants and animals, would do well to examine this text very carefully before making an adoption.

A GUIDE TO THE SPRING FLOWERS OF MINNESOTA, C. O. ROSENDAHL and F. K. BUTTERS, *University of Minnesota Press, Minneapolis, 1937. \$1.00.*

This key to the spring flowers of Minnesota will be of interest to plant taxonomists in general and to those botanists or collectors whose states are nearly alike in climate or other conditions to Minnesota.

HANDBOOK OF MICROSCOPICAL TECHNIQUE, C. E. MCCLUNG, *Paul B. Hoeber, New York, 1937. \$8.00.*

The book indispensable in every cytological laboratory as well as wherever histological work is carried on is McClung's famous Microscopical Technique. From the very first issue of the notable first edition it has occupied a most enviable position. This revised and enlarged second edition will but increase its general serviceability, as well as its popularity. Poor indeed the library which cannot afford a copy!

THE HARVEY LECTURES, HARVEY SOCIETY OF NEW YORK, *Williams & Wilkins Co., Baltimore, 1937. \$4.00.*

Eight papers originally read before the Harvey Society of New York during the season of 1936-37 by Drs. W. Penfield, E. Landis, S. W. Ranson, R. Schonheimer, T. Madsen, H. S. Gasser, C. N. H. Long and Sir Henry Dale, cover a wide range of subjects in the medical and biological fields.

IN QUEST OF GORILLAS, W. K. GREGORY & HENRY C. RAVEN, *The Darwin Press, New Bedford, 1937. \$3.50.*

It is difficult to classify such a book as this. It comes from the pens of two reputable scientists, deals with the search for gorillas in the Congo, and discusses geology, anthropology, and

zoology with equal ease. A Scientific Book Club choice, it will rank for years as one of the best narratives of big game hunting with a scientific purpose.

INSECT ENEMIES OF BOOKS, H. B. WEISS & R. H. CARRUTHERS, *New York Public Library, New York, 1937. Paper, 30 cents.*

Librarians as well as entomologists will be interested in this intensely practical paper on the common nuisances of all book collections. There is a bibliography of 36 pages which should be most valuable to the entomologists, coming as it does from professional librarians who have so much at stake in combatting these pests.

INTERVIEWING ANIMALS, BASTIAN SCHMID, *Houghton Mifflin Co., Boston, 1937. \$3.00.*

A collection of stories about animals for the animal lover, translated very intelligently from the German by Bernard Miall. While the documentation would probably not suit an animal behaviorist, the incidents are interesting in themselves, and well told.

LABORATORY OUTLINE IN FILTERABLE VIRUSES, ROSCOE R. HYDE, *Macmillan Co., New York, 1937. \$1.50.*

The development of new techniques in modern biology is always a more or less mysterious thing until they have become common property. From the private research laboratory where they originate to general use in the class room is sometimes a long and tedious interval. Bridging that gap is the task of the present text. Coming from the school of Hygiene and Public Health at Johns Hopkins, it merits attention.

LABORATORY OUTLINES FOR ANIMAL BIOLOGY, M. F. GUYER & H. W. HELLBAUM, *Harper & Brothers, New York, 1937. \$1.50.*

A comprehensive and heavily bound laboratory manual of some seventy studies with blank paper interleaves to be used with Dr. Guyer's text book on the same subject.

LABORATORY PRACTISE OF ORGANIC CHEMISTRY, G. ROSS ROBERTSON, *The Macmillan Company, New York, 1937. \$2.25.*

To bridge the ever widening gap between theoretical and practical organic

chemistry is the aim of this book. The treatment of the matter is so extensive, and so advanced at times, that the beginner will not find it an easy text. Both in the discussion of fundamental operations used in the organic laboratory, and in the selection of experiments to bring out new problems and techniques, it gives the student a fine preparation for later work in organic analysis.

LABORATORY STUDIES IN COMPARATIVE ANATOMY, W. C. SENNING, *McGraw-Hill Book Co., New York, 1937. \$1.75.*

Based on the Shark, *Necturus* and Cat this text in Vertebrate Anatomy makes up in thoroughness for what it may lack in the number of type forms to be studied,—which we think is a rather interesting idea.

LEISURE LEAGUE TITLES, LEISURE LEAGUE OF AMERICA, 30 Rockefeller Plaza, New York, 1934-1937. 50 cents each.

We have just made a discovery! There is a growing series of little books, effectively and attractively gotten together, on a multitude of subjects,—twenty-seven by our last count,—and sold for the munificent sum of fifty cents apiece. Beginning with the No. 1 volume on "The Care and Feeding of Hobby Horses," and running down through Mann's "Tropical Fish," Strong's "Photography for Fun," Solomon's "Hiker's Guide," Johnson's "Hunting with a Microscope," to Rine's "A Dog's Life," we bought a handful of these lively books. As a result we recommend them to you, for your own personal use, or for gifts to your friends who like intelligent hobbies.

A LIST OF MISSOURI FUNGI, WILLIS E. MANEVAL, *University of Missouri, Columbia, 1937. \$1.25.*

A convenient list of the plant pathogenic and wood destroying fungi found in the state of Missouri, together with their host plants. This latter feature is particularly helpful since there is also a separate list of hosts together with the parasitizing forms affecting each.

THE MAKING OF A SCIENTIST, RAYMOND L. DITMARS, *The Macmillan Co., New York, 1937. \$2.75.*

Every Ditmars book is an event, and this book is no exception, dealing as it does with the events and circumstances that helped to make him the national figure that he is. Mr. Ditmars has one faculty in superabundance and that is an ability to tell an interesting story. Here we have him at his best, telling most interestingly a story about himself.

MARINE GAME FISHES OF THE PACIFIC COAST, LIONEL A. WALFORD, *University of California Press, Berkeley, 1937. \$5.00.*

Another scientific as well as popular work published as only these Californians seem to be able to publish, with numerous black and white, and natural color photographs. There is not a fisherman from the Gulf of California to the Strait of Juan de Fuca who would not itch to have as well as hold this book. It is quite the most elaborate, yet useful, book we have seen in a long while.

METHODS IN PLANT PHYSIOLOGY, WALTER E. LOOMIS and CHARLES A. SHULL, *McGraw-Hill Book Co., New York, 1937. \$4.50.*

This is a research handbook as well as a laboratory manual for use in all the plant sciences. Instructors in general botany just as well as research workers in advanced plant physiology will find use for the many helpful features in the work. Certainly we have constant need for new suggestions to help make our elementary classes both interesting and practically informative. This book seems to be able to supply that need. There is a useful chapter by George W. Snedecor on statistical methods.

MICROBIOLOGY AND PATHOLOGY, CHARLES F. CARTER, *C. V. Mosby Co., St. Louis, 1936. \$3.00.*

An expansion of the author's "Bacteriology for Nurses" to include not only the bacteriological information needed or useful in the nursing profession, but also the manifestations of various common diseases and debilities

which nurses should know about. The book should be specially helpful to city and county nurses who must frequently make preliminary secret diagnoses in the absence or preliminary to the arrival of a physician.

MYSTERIES OF NATURAL HISTORY, E. L. GRANT WATSON, *Fredrick A. Stokes Co., New York, 1937. \$1.75.*

A collection of nature studies centering chiefly about the denizens of forest, field and bush in Australia and the New Zealand, this book brings a number of interesting observations on the lives and behavior of many little known forms.

NATURAL HISTORY, CHARLES TATE REGAN ed., *Hillman-Curl, Inc., New York, 1937. \$6.00.*

Somewhat along the lines of Hegner's "Parade of the Animal Kingdom," this 896 page work with more than a thousand illustrations, some in color, is very well able to speak for itself. That the editor is the director of the British Museum of Natural History, and that the contributors are members of the staffs of various English museums or zoological gardens, makes the work so much the more reliable.

NATURE MAGAZINE'S GUIDE TO SCIENCE TEACHING, E. L. PALMER, *American Nature Association, Washington, 1936.*

How to use the "Nature Magazine" in the first ten grades as a means of teaching science, particularly along personal experience lines. A complete file of recent issues of the magazine would of course be necessary to carry it out.

OUTLINE DRAWINGS FOR LABORATORY STUDIES IN COMPARATIVE ANATOMY, W. C. SENNING, *McGraw-Hill Book Co., New York, 1937. \$1.50.*

A large loose-leaf set of well-executed sketches and drawings to be labelled by those who use the author's "Laboratory Studies in Comparative Anatomy," as a textbook.

OUTLINE OF GENERAL PHYSIOLOGY, L. V. HEILBRUNN, W. B. SAUNDERS Co., *Philadelphia, 1937. \$5.00.*

Teachers and students who feel that physiology is not necessarily a preface

to or an appanage of medicine will welcome another extensive work either as classroom text or reference volume. Heavily documents, it should furnish a fine stimulus to consultation of original articles referred to wherever library facilities warrant.

PALAEONTOLOGY, INVERTEBRATE; HENRY WOODS, *Cambridge University Press, Macmillan Co., New York, 1937. \$3.25.*

This is the seventh edition of a work that has almost become a classic in its field. The teacher of invertebrate zoology, or of any course in evolution who ignores this compact little volume does not know what he is missing. It fills a very necessary niche in our biological structure.

PERKEY, AGNES AKIN ATKINSON, *Viking Press, New York, 1937. \$1.50.*

The exhibitionism of a Californian pole-cat which is in the way of becoming adapted to civilization, as told by an inhabitant of the "Man House" and all that sort of thing. Perfectly swell illustrations.

PHYSIOLOGICAL HYGIENE, CLEVELAND P. HICKMAN, *Prentice-Hall, Inc., New York, 1937. \$3.25.*

This is a complete textbook for a college course in hygiene. It is most emphatically *not* a textbook in physiology. In fact, there is not a single physiological equation, formula, or experiment between its covers. As a book on hygiene it looks excellent. To call it physiology, with the meaning the educated world today attaches to the term, is simply misleading.

PHYTOHORMONES, F. W. WENT & KENNETH V. THIMANN, *Macmillan Co., New York, 1937. \$4.00.*

This is another number in the excellent series of Experimental Biology Monographs being issued by the Macmillan Co. It is a thorough exploration of modern research in the growth-hormones of plants. The extensive bibliography is a warrant for the completeness and trustworthiness of the book.

PICTURING MIRACLES OF PLANT AND ANIMAL LIFE, ARTHUR C. PILLSBURY, J. B. Lippincott Company, *Philadelphia, 1937. \$3.00.*

The author is a very successful "Nut" on the subject of biological photogra-

phy, and here describes some of his procedures. The work is not horribly scientific, but it is diabolically interesting.

PLANTS USEFUL TO MAN, W. W. ROBBINS & F. RAMALEY, *P. Blakiston's Son & Co., Philadelphia, 1937. \$3.50.*

This is the second edition of a reference and supplementary text for almost any course in the plant sciences. After all, the practical side of our theoretical teaching does need some emphasizing by even the most idealistic. More than one course has gradually eliminated itself from college catalogs by reason of an intense concentration on theoretical phases when a saving dash of practicality might have made it a perennial favorite.

POISONS, POTIONS AND PROFITS, PETER MORELL, *Knight Publishers, Inc., New York, 1937. \$2.00.*

With sublime indifference to possible consequences this man Morell tackles one of the worst problems confronting intelligent people everywhere,—the problem of high-pressure salesmanship on the air. As a result this is not precisely a pleasant book, but it is a good one.

PONDFISH CULTURE, PERCY VIOSCA JR., *Pelican Publishing Co., New Orleans, 1937. \$4.00.*

Percy Viosca is so well known to southern biologists and fishermen that this accumulation of his practical as well as theoretical knowledge will be welcomed heartily. Northerners who are interested in a more or less untechnical treatment of a subject which has been somewhat of a fish-hatchery monopoly, will be glad to add Viosca to the circle of their literary acquaintances. He and his book deserve it.

THE PSYCHOLOGY OF EATING, LEWIS ROBERT WOLBERG, *Robert M. McBride & Co., New York, 1936. \$3.00.*

This is another unusual book. It is not a book of diet faddism. Indeed, the author pays his respects to the various faddists in no uncertain terms. He goes much further, however, and not only gives some intelligent advice about eating in general, but also about over-eating in particular. An unexpected surprise is the large number of

toothsome-appearing recipes to be used by those who wish to eat and remain slim.

THE SAVAGE HITS BACK, JULIUS E. LIPS, *Yale University Press, New Haven, 1937. \$5.00.*

Yale University Press is to be congratulated on producing this book. First of all, the translation from the original German is entirely adequate; secondly the printing and illustrations leave nothing to be desired, and finally the subject matter turns out to be a riot of anthropological humor. Here we see exactly how from his sculptured work the native views our white civilization in the representatives we send him. The reader of this work will not want to miss Dr. Lips' account of his experiences with the Reichsfuehrer's government before he was forced to escape to America.

THE SEA, CORNELL RURAL SCHOOL LEAFLET, *Ithaca, 1937.*

This is an attractive and easily understood little pamphlet put out for the benefit of New York State school children. It is an interesting example of basic scientific education.

SNAKES ALIVE, CLIFFORD H. POPE, *The Viking Press, New York, 1937. \$2.50.*

This is an attractive work by a very well known authority on snakes. Written for the express purpose of disabusing a lot of popular superstitions and misinformation on the subject of the earth's lowliest and most misunderstood animals. The identification key at the back of the book has been hailed as the best thus far offered.

A STORY OUTLINE OF EVOLUTION, CHARLES W. GRIMES, *C. P. Hoagland Co., Somerville, N. J., 1937. \$2.00.*

Biologists who believe in Evolution as Nature's working out the Creative Plan, and who wish to put a thoroughly interesting, reliable (but undocumented), book into the hands of their misunderstanding friends, would do well to procure several copies of this work.

STRUCTURE OF THE VERTEBRATES, MALCOM E. LITTLE, *Farrar & Rinehart, New York, 1937.*

This is a revised edition of Little's 1932 text. It omits many of the minor

details embraced in the older work and redirects the treatment of the subject closer to the structure of man.

STUDIES, INSTITUTUM DIVI THOMAE, Cincinnati, 1937. \$2.00 the year.

This is the first issue of a new quarterly destined to present the research carried out at that surprisingly unique institution, the Institutum Divi Thomae, graduate school of scientific research of The Athenaeum of Ohio, first opened in June 1935. This venture was initiated by the Archbishop of Cincinnati, himself a Dominican, and named for the great Dominican mediaeval scholar, Thomas Aquinas, who is popularly known in scholastic circles as the "divine Thomas." The development of neo-scholasticism in Catholic schools has been the reason for the return to scientific research as exemplified in the world-famous Institute Carnoy of Louvain University, the Institutum Divi Thomae in this country, and the newly founded Pontifical Academy of Science. Papers included in this volume of "Studies" are all physiological in content.

SYPHILIS, MORRIS FISHBAIN, David McKay Co., Philadelphia, 1937. \$1.00.

When the frontal attack on our commonest social disease was initiated by the Surgeon General of the United States, we were reminded of the old college song in which the recurrent lines ran: "mustn't say the naughty word, mustn't say the naughty word." Such has been the common attitude in this country on syphilis. Now that the very word can be uttered over the radio systems without summary silencing, there is some hope that books like this excellent little brochure by the editor of the A. M. A. Journal, Hygeia, and the Health Magazine, will do a lot of good. It needs enthusiastic spreading by every conscientious biologist.

TERMITE CITY, ALFRED E. EMERSON & ELEANOR FISH, Rand McNally & Co., Chicago, 1937.

This children's book is written by a pair of real scientists who not only know their subject and write intelligently about it, but also have the good sense not to become as chummily anthropomorphic about their termites as

some other children's book it has been our ill fortune to review.

TWINS, H. N. NEWMAN, F. N. FREEMAN and K. J. HOLZINGER, University of Chicago Press, Chicago, 1937. \$4.00.

Treating as it does of the mental and physical similarities of identical twins reared together as compared with fraternal twins reared together, and identical twins reared apart, this book is unquestionably one of the most important studies ever made in that challenging and fascinating field. Chicago University is to be congratulated on this piece of research, made under the direction of a biologist, a psychologist and a statistician which demonstrates that neither heredity nor environment is the sole answer to differences, but that both have their part to play. There should be more of this type of composite research.

VITAMINS, MINERALS AND HORMONES, ALBERT P. MATHEWS, William Wood & Co., Baltimore, 1937.

Three chapters on as many subjects from the author's "Principles of Biochemistry" reprinted by request.

WHAT IT MEANS TO GROW UP, FRITZ KUNKEL, Charles Scribner's Sons, New York, 1937. \$2.00.

Since most of the deluding and self-confidence-shattering complexes or fixed ideas have their source in youth, this book is a real contribution to the working library of any one who has to deal with personality problems.

WHO'S WHO IN THE ZOO, RALPH DE SOLA, Ed., Halcyon House, New York.

A beautifully gotten out picture-book of the mammals in the various zoos of the New York Metropolitan area, with short descriptive passages with strange and sundry bits of information about each specimen. It is a production of the WPA Federal Writer's Project of New York City.

WILD ANIMAL WORLD, R. L. DIMMERS and WILLIAM BRIDGES, D. Appleton-Century Co., New York, 1937. \$3.00.

Subtitled "Behind the Scenes at the Zoo," this book is a general summary of the experiences encountered by the

keepers in a zoo, from the time a specimen animal is caught until it becomes acclimated to its new environment and begins to reproduce. The book should help to make a zoo better understood, and therefore a greater educational as well as recreational factor.

WILDERNESS WANDERERS, WENDELL and LUCIE CHAPMAN, *Charles Scribner's Sons, New York, 1937. \$3.75.*

Four years work photographing the wild life of the United States, particularly in the Rocky Mountain regions resulted in this book. It adds another chapter to our ecology, and animal behavior. In addition, it is jolly good reading. Not a research work, of course, but one of those stimulating volumes which would help to form an incentive to zoological research on the part of a youngster.

THE WONDER WORLD OF ANTS, WILFRID S. BRONSON, *Harcourt Brace & Co., New York, 1937. \$1.50.*

Here is another brightly illustrated animal book for children,—but the children will have to wait upon adult pleasure for their turn at the book. The catchy thumbnail sketches of historical and other events which illustrate kindred events in ant colonies are a happy thought. This book is good.

ZERO TO EIGHTY, E. F. NORTHRUP, *Scientific Publishing Co., Princeton, N. J., 1937. \$3.00.*

This is a piece of scientific fiction which rates far above the usual amazing adventure type of thing. Writing under the pseudonym of Dr. Pseudoman, the life of a scientist born in 1920 and dying in 2000 is described with special reference to his trip around the moon in a ship propelled by electric guns. The story out-Vernes Jules Verne, but has infinitely more scientific background.

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My heart goes seaward with the rising star:
This of myself that flowered from the earth,
Tasted the soil, and shared the foliate birth
Of the red roses spilling in the jar.
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That takes the brief erosion of the night,
And burns in the high candle all delight,
Making the soul a moth. So we that are
Its pawns and, living, bade the pillars rise,
And girded oceans with a vessel's wake,
Still look upon the sweet illumined skies
And ask for wonder for the wonder's sake,
And carry to the graves that shut us in
The sea and the stars and all that they
have been.

BURNING BUSHES

I saw the sun slant past a tenement
And splash its gold against a dingy wall
As though God stooped to give love's sacrament
To that one home . . . I watched the last light fall
Upon the lacework of a lofty tree
Consuming it with fiery lavender.
I doffed my hat before the mystery
Revealed to me by God's gay messenger.
One burning bush by Sinai's rugged way
Arrested Moses like a brigand chief,
But this gold glory I have seen today
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Surmounts the limitations of belief,
And changes this dirt earth to heaven for me.

—Harry Elmore Hurd.



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